SCIENCE

FRIDAY, NOVEMBER 9, 1900.

CONTENTS:

MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

*THE IMPERIAL PHYSICO-TECHNICAL INSTITUTION IN CHARLOTTENBURG.**

I. HISTORICAL.

THROUGH the courtesy of Professor Kohlrausch, President of the Reichsanstalt, and the Curatorium or governing body of the institution, the writer was accorded the privilege of working in the Physikalisch-Technische Reichsanstalt as a scientific guest during the last few months of 1899. An unusual opportunity was thus afforded of learning rather intimately the methods employed and the results accomplished in this famous institution for the conduct of physical research, the supply of standards and the verification of instruments of precision for scientific and technical purposes.

It is well-known that the Reichsanstalt is situated in Charlottenburg, a suburb of Berlin just beyond the renowned Thiergarten. The buildings occupy an entire square, the larger part of which, valued at 500,000 Marks, was the gift of Dr. Werner Siemens. In making this gift, which was offered in land or money at the option of the government, Dr. Siemens declared that he had in mind only the object of serving his fatherland and of demonstrating his love for science, to which he avowed himself entirely indebted for his rise in life.

* A paper presented at the 146th meeting of the American Institute of Electrical Engineers, New York, September 26, 1900.

'Richard Owen, a paleontologist of some repute.'

IT is stated that the bicentennial monographs to be written by Yale professors, publication of which will begin early next spring, will number not fewer than twenty-five. President Hadley and Professors Morris, Chittenden and Dr. T. T. Munger, of the Yale corporation, will have charge of the publications.

THE catalogue of the birds of New York State, undertaken by Dr. Marcus S. Farr, has made important progress and the first edition will probably be ready for publication within six months.

BOOKS RECEIVED.

The Laws of Gravitation. Memoirs by NEWTON, BOUGUER and CAVENDISH. Edited by A. STANLEY MACKENZIE. New York, Cincinnati and Chicago, The American Book Company. 1900. Pp. vii + 160.

The Effects of a Magnetic Field on Radiation. Memoirs by FARADAY, KERR and ZEEMAN. Edited by E. P. LEWIS. New York, Cincinnati and Chicago, The American Book Company. 1900. Pp. xviii + 102.

A Handbook of Photography in Colors. THOMAS BOLAS, ALEXANDER, A. K. TALLENT and EDGAR SENIOR. New York and Chicago. E. and H. T. Anthony & Co. London, Marion & Co. 1900. Pp. 230.

Studies of Animal Life. WALTER WHITNEY LUCAS. Boston, New York and Chicago. D. C. Heath & Co. 1900. Pp. 106.

Von Richter's Text-book of Inorganic Chemistry. Edited by H. KLINGER, translated by EDGAR F. SMITH. Fifth American Edition, Philadelphia. P. Blakiston's Son & Co. 1900. $1.75.

SCIENTIFIC JOURNALS AND ARTICLES.

The American Journal of Science for November contains the following articles:

'Elaboration of the Fossil Cycads in the Yale Museum,' by L. F. Ward.

'Chemical Composition of Turquois,' by S. L. Penfield.

'Quartz Muscovite Rock from Belmont, Nevada; the equivalent of the Russian Beresite,' by J. E. Spurr.

'Volumetric Estimation of Copper as the Oxalate, with Separation from Cadmium, Arsenic, Tin and Zinc,' by C. A. Peters.

'Synopsis of the Collections of Invertebrate Fossils made by the Princeton Expedition to Southern Patagonia,' by A. E. Ortmann.

'Cathode Stream and X-Light,' by W. Rollins.

IN the first report of the Michigan Academy of Science there is an abstract of a paper by Jacob Reighard on 'The Breeding Habits of the Dog-Fish, *Amia calva*,' showing that the nests are made by the male sometime before the spawning season by biting or tearing away aquatic plants, or other material on the bottom, leaving a concavity lined with roots, gravel or water-soaked plants. These nests may be quite near together or a considerable distance apart according to the numbers of fish and character of the bottom, and a single nest may be used by two fish in succession, consequently containing eggs in very different stages of development. The act of spawning occupies several hours, the eggs being deposited at considerable intervals.

The American Naturalist for October has for its leading article a 'Reconsideration of the Evidence for a Common Dinosaur-Avian Stem in the Permian,' concluding that this hypothesis should not be discarded, but very seriously kept in view. W. A. Cannon discusses 'The Gall of the Monterey Pine' and W. S. Nickerson has a 'Note on *Distomum arcanum* (n. sp.) in American Frogs' a species found so far only in frogs from Massachusetts. G. W. and E. G. Peckham have a brief article 'Instinct or Reason' noting a case in which one of the solitary wasps was led to depart from the customary manner of dragging insects into her burrow. The usual instalment of synopses of North American invertebrates is lacking. Editorial Comment, Reviews, etc., complete the number.

The Popular Science Monthly begins its fifty-eighth volume with the November number and has for its frontispiece a portrait of the late James Edward Keeler. The first article is an instalment of Professor Newcomb's 'Chapters on the Stars' and treats of binary and multiple stars, star clusters, nebulæ, and the methods by which they are investigated. Under 'Rapid Battleship Building' Waldon Fawcett notes the (comparatively) short time in which some of the very largest vessels have been constructed. The second part is given of 'The Address of

the President (Sir William Turner) before the British Association for the Advancement of Science,' H. S. Pritchett discusses 'The Population of the United States during the Next Ten Centuries' computing that by 2900 it will amount to 41 billions, and Edward Atkinson has an article on 'The Distribution of Texas.' Clinton Rogers Woodruff considers in a hopeful vein 'Municipal Government now and a Hundred Years ago' and William Barclay Parsons has an article on 'China' giving a brief outline of its political and physical status. David Starr Jordan contributes a short skit on 'Rescue Work in History' and W. W. Campbell presents an appreciative sketch of James Edward Keeler. In 'Discussion and Correspondence' attention is called in an article that deserves to be read and heeded, to the literary sins of many writers on scientific topics. There are reviews of current scientific literature and notes of the progress of science.

SOCIETIES AND ACADEMIES.

BIOLOGICAL SOCIETY OF WASHINGTON.

The 326th meeting was held on Saturday evening, October 20th, and was devoted to a 'Symposium on Cotton.'

H. J. Webber presented some 'Notes on Cotton Hybrids,' stating that the attempt was being made to produce a plant which should possess the long staple of the Sea Island Cotton, have a seed that would admit of the ready removal of the fiber and would grow well on the uplands. Hybrids he said were as a rule more vigorous than the parent plants, although being as regards structure and appearance intermediate between them. The speaker described some of the crosses that had been made and exhibited a series of specimens showing the successful results that had followed.

L. H. Dewey spoke concerning 'Some Foreign Varieties of Cotton,' saying that while the United States annually produces cotton to the value of nearly $400,000,000, it imports each year about $4,000,000 worth for special purposes. Most of our imported cottons, it was said, came from Egypt where they have been developed from Sea Island cotton, by long cultivation under irrigation, in a dry and practically rainless climate. The lint varies from snow white in 'Abbasi' to brown in 'Mitafifi.' The plants are large and spreading, similar to our Sea Island plants, but larger and with yellow flowers and small '3 locked' bolls. The lint is strong, lustrous, soft, and with a well developed twist. It is used chiefly for fine knit goods and for mercerized goods.

Peruvian cotton, which is borne on perennial cotton plants, has a short, brown, finely crimped fiber, and is imported for mixing with wool which it resembles.

A white uneven lint is produced in Porto Rico from a perennial plant, and plants of the 'kidney cotton' type are cultivated in the Philippines. In Paraguay the two principal varieties grown are red cotton (*Algodon colorado*), producing a reddish brown lint, and white cotton (*Algodon blanco*) producing white lint.

Nearly all varieties mentioned were illustrated by specimens, and leading American and Egyptian varieties were illustrated by full sized plants with flowers and mature bolls.

W. A. Orton read a paper on 'Selection for Resistance to the Wilt Disease of Cotton' a malady which has caused serious injury in the Sea Island Cotton and is becoming more troublesome in the upland cotton. It is caused by a soil parasite, *Neocosmospora vasinfecta* (Atk.) Erw. Sm., which attacks the young rootlets and grows from them into the vascular bundles of the main roots and of the stem, which are filled. The brown discoloration of the wood produced by the fungus is a characteristic symptom of the disease. Trials had been made of a large number of soil fungicides, but none had been found successful and the greatest hope of remedy seemed to lie in the production by selection of immune races of cotton.

A test of twenty kinds of cotton showed that the Egyptian sorts and one American upland variety, the Jackson, were strongly resistant to the wilt disease. These plants were somewhat dwarfed by the disease and there were numerous root tufts present, which demonstrated the presence of the fungus in the soil, and showed that the plants were actually resistant. Individual plants in diseased fields are often found living when all others around them have been killed, and seed from such plants has been